DOCUMENT RESUME

ED 050 665 HE 002 124

AUTHOR Bridgeman, W. J.
TITLE Student Perceptions as a Function of Reinforcement and Expectancy Conditions.
INSTITUTION American Educational Research Association, Washington, D.C.
PUB DATE 5 Feb 71
NOTE 18p.; Paper presented at the 55th Annual Meeting of the American Educational Research Association, New York, February 5, 1971

EDRS PRICE EDRS Price MF-$0.65 HC-$3.29
DESCRIPTORS *College Students, Expectation, *Higher Education, *Interpersonal Relationship, Laboratory Experiments, *Perception, Reinforcement, *Social Reinforcement

ABSTRACT

This paper describes a laboratory experiment which was a replication and extension of an earlier study, both of which are part of an effort to synthesize the findings of two somewhat different approaches to the study of interpersonal attraction. The first of these approaches is a secondary reinforcement interpretation and in general assumes a positive linear relationship between social reinforcement and social attraction. The second approach is a "cognitive consistency" interpretation and generally is not so explicit about functional relationships between consistency factors and interpersonal attraction. The hypotheses tested in this study were: (1) that the function relating reinforcement frequency to interpersonal attraction will be nonlinear for each of the two levels of expectancy; and (2) that the point of maximum attraction for the group with the higher reinforcement expectancy value will be reliably greater than for the group expecting the lower level of reinforcement. The subjects for this study were 210 male volunteers from campus ROTC units, who principally met in groups of four and were assigned to treatment groups at random. The activities were divided in three phases: (1) preexperimental interaction, (2) the experimental activity, and (3) postexperimental debriefing. The findings supported the first, but not the second hypothesis. (AF)

ED050665

STUDENT PERCEPTIONS AS A FUNCTION OF REINFORCEMENT AND EXPECTANCY CONDITIONS

W. J. Bridgeman
Miami University
Oxford, Ohio

Paper presented at 55th annual convention of the
American Educational Research Association
New York, New York
February 5, 1971

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

HE 002 124

Student Perceptions as a Function of
Reinforcement and Expectancy Conditions

This laboratory experiment was a replication and extension of an earlier study (Bridgeman, 1970) and both are part of an effort to synthesize the findings of two somewhat different approaches to the study of interpersonal attraction.

The first of these approaches is a secondary reinforcement interpretation and in general assumes a positive linear relationship between social reinforcement and social attraction (cf., for example, Byrne, 1965a, 1965b; Lott and Lott, 1965; Staats, 1958). The second approach is a "cognitive consistency" interpretation and generally is not so explicit about functional relationships between consistency factors and interpersonal attraction. However, Jackson (1960), in a discussion of group norms, does suggest that social evaluation may be a non-monotonic, generally quadratic function of behavioral discrepancies from "the norm" or from expectation.[1]

---

[1] Brevity precludes a more adequate review of the literatures attending these approaches. For a more complete treatment of the general problem of relating affective response to reinforcement and expectancy variables, the interested reader may find the following studies useful: Baron, 1966; Bevan, 1968; Carlsmith and Aronson, 1963; Lamb and Singer, 1966; Sampson and Sibley, 1965; Verinis, Brandsma and Cofer, 1968.

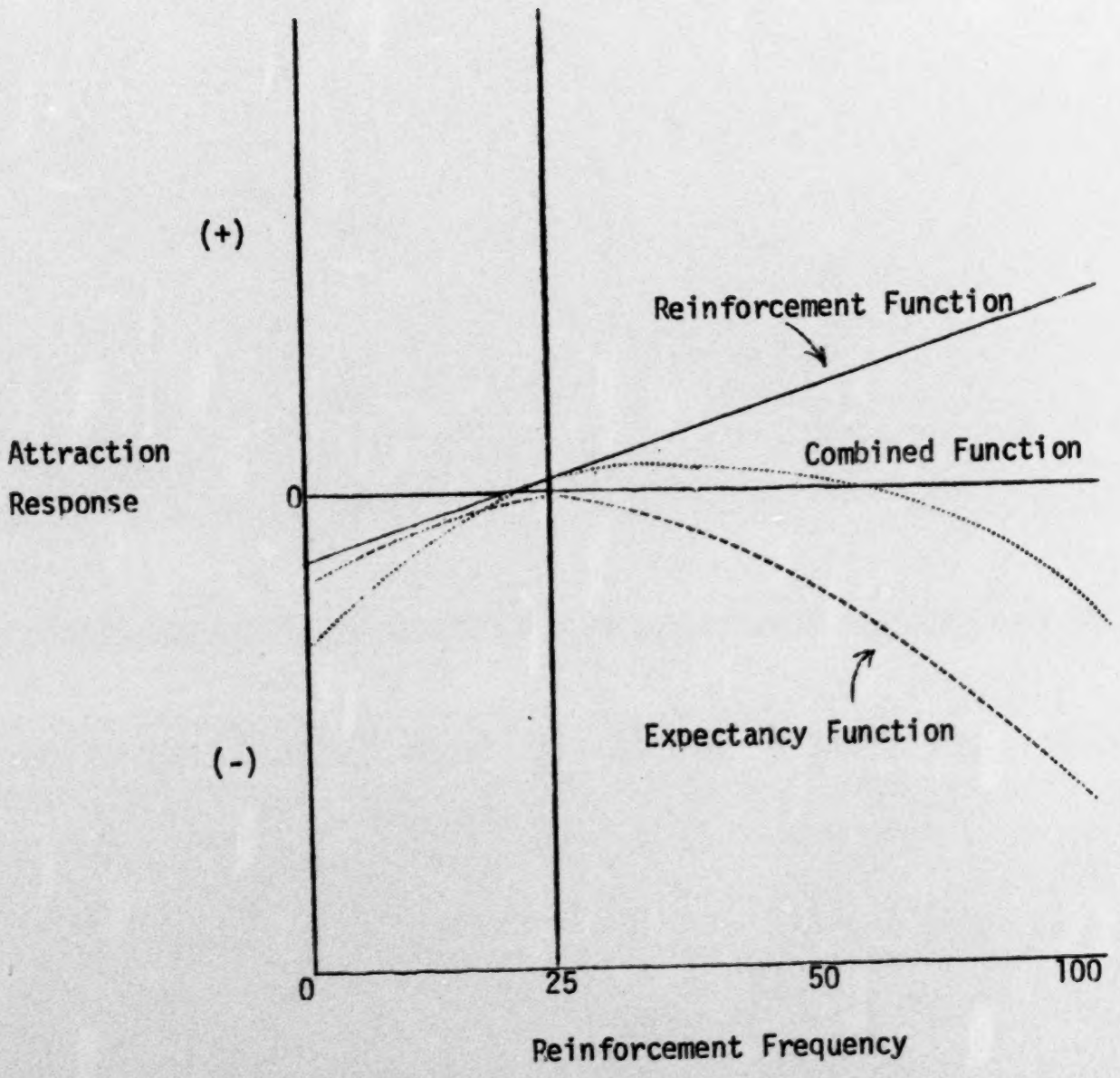

Figure 1. Schematic illustration of the hypothetical relationships between evaluative intensity and (1) reinforcement frequency, (2) expectancy-discrepancy characteristics of the reinforcing behavior and (3) the additive combination of these two factors.

Figure 1 illustrates schematically the initial attempt to integrate these reinforcement and expectancy interpretations. It should be apparent that the curves in the schema are largely arbitrary as to their exact values and their placement, particularly with respect to the affective plane. However, they are generally consonant with existing reinforcement and expectancy hypotheses. It should be noted that--in the interest of simplicity--the schema assumes that expectancy affect and reinforcement affect combine additively.

Present purposes preclude discussion of all the implications evident in Figure 1. Instead, attention is directed to one of the more obvious hypotheses suggested by the paradigm, viz., that the function relating interpersonal attraction and reinforcement, when there are explicit expectancies for a particular reinforcement value, will be non-linear and generally quadratic in form.

In reviewing the empirical literature for studies testing hypotheses about functions relating reinforcement-expectancy variables to social evaluation, only one (Harvey and Clapp, 1965) was found. In that study no support was found for other than a linear relationship, but the failure to include a reinforcement conformity treatment group in the design would appear to render the findings inconclusive.

Bridgeman (1970) employed a design involving four levels of reinforcement, one of which conformed to the expected level of reinforcement. Trend tests results supported the non-linear hypothesis, but there was reason to suspect that there were systematic differences in the way some of the Ss had interpreted the expectancy instructions. Post hoc analyses of the data (regrouped on the basis of the two suspected levels of expectancy) suggested that the non-linear hypothesis was

still tenable.

The present study was expanded to include seven levels of reinforcement frequency and two levels of expectancy for reinforcement frequency. The hypotheses tested were:

(1) that the function relating reinforcement frequency to interpersonal attraction will be non-linear for each of the two levels of expectancy;

(2) that the point of maximum attraction for the group with the higher reinforcement expectancy value will be reliably greater than for the group expecting the lower level of reinforcement. This latter hypothesis would seem to follow from Figure 1, if the expectancy gradient were shifted appropriately on the reinforcement frequency axis.

Subjects

Two hundred ten male volunteers from campus ROTC units participated in the study. Ss met principally in groups of four, but several sessions were run with two and three Ss. Assignment to treatment groups was random.

Procedures

The experimental variables were made operational as part of a series of test situations ostensibly designed to evaluate the performance of student teachers. The reinforcement frequency variable was manipulated by controlling the outcomes in a simple game situation. The expectancy factor was varied by employing different instructions for the game situation. The dependent variable, interpersonal attraction, was measured using the amount of pre-post experimental change on a 37-item

"Personal Evaluation" questionnaire. This attraction questionnaire was developed in an earlier study (deCharms and Bridgeman, 1961), revised for use in the Bridgeman (1970) study, and was further revised slightly for the present study.

All activities were conducted in a small groups communication laboratory at Miami University. As noted above, the experimental activities were represented to the Ss as an exploratory project, the purpose of which was to develop procedures for evaluating and screening student teacher (ST) candidates. Ss were informed they would be asked to evaluate the performance of an ST at a number of "situational" test tasks which simulated some common teaching functions. Parallels were drawn with business games and management "simulations" in an effort to lend further credibility to the activities.

The ST (a confederate) always arrived after the Ss had convened and after a brief identificational exchange with E, he was ushered away to an adjoining room. It was explained to the Ss that in the procedures all communication between the ST and the Ss would be carried on over an intercom in order to minimize any influence that the ST's appearance, mannerisms, etc., might have on their evaluations. Similarly, they were asked not to converse with one another during the procedures to avoid influencing one another's reactions.

The activities themselves can be divided into three phases:

Phase I: Pre-experimental interaction. This was an exchange between the ST and Ss which was designed to provide for all Ss a standard, minimal basis for responding to the "Personal Evaluation Questionnaire" (the pre-experimental attraction measure).

In this phase ST gave two brief talks, one prepared and one ex-

temporaneous. Both dealt with educational issues and both had been pre-recorded to assure standard content and quality for all Ss.

The extemporaneous quality of the second talk was achieved by carefully varying the speaker's delivery and by staging two bits of pseudo-interaction between Ss, the E, and the ST. For example, at the same time that Ss evaluated the ST's first "prepared" talk, they were asked to write in a topic which they wished ST to address in his extemporaneous talk. These topics were always pointedly delivered to the ST by E. Given the restrictions on conversation between the Ss (which was monitored), the actual topic of the extemporaneous tape was customarily perceived as having been selected by one of the other Ss.

Immediately following this second, extemporaneous talk, Ss completed the pre-experimental form of the attraction measure.

Phase II: The experimental activity. During this sequence Ss participated in a simple, game-like activity (adapted from Hollander, 1958) involving a 10 x 10 cell matrix in which were randomly arrayed the numbers 0, 4, 5, 6, 9, 10, 14, 15, 16, 20. Ordering of the numbers differed in each of the four matrices used by the Ss.

The basic game procedures required the Ss (who were isolated from one another) to make choices of matrix rows which then were to be paired with a single column selection (on each trial) made by the ST to be used as coordinates in identifying the cell in the number matrix containing the number of poker chips they were to receive on that trial. To allow for some variability in "winning" and "non-winning" (it was not of interest to have them "lose" chips) outcomes, a winning trial was defined to be a trial outcome of more than 10 chips. Actually, game outcomes were controlled so as to be standard (with regard to both fre-

quency and sequence of winning) in all seven reinforcement levels.

Control of Ss outcomes without their awareness was possible through manipulation of the intercom system. The system permitted independent control of the send and receive capabilities between five stations. Thus, for all communications between the ST and the Ss--except the announcement of his column choice on each trial--all Ss could receive ST simultaneously (however, Ss were never able to send or receive between themselves). After all Ss had selected rows on a game trial, ST, though ostensibly announcing a single column selection for all Ss, actually announced a separate column for each S which, in all cases, yielded the prescribed outcome for that particular trial.

The rationale given the Ss for such an activity was that it was a simple "standardized" performance test of a person's ability to resolve a rapid series of decision conflicts. It was explained that the ST's assignment was to manage the game activities in such a way as to achieve the most equitable game outcomes for all group members and at several places in the instructions it was stressed that "equitable outcomes" meant winning on 25% (or 50%) of all game trials. This, of course, constituted the manipulation of the expectancy variable.

To make the ST's task appear relatively complex, it was explained that the ST could keep no written record of the progress of the game. The game proceeded for 20 trials in which all Ss received one of seven proportions of winning trials--0%, 10%, 25%, 50%, 75%, 90% or 100%.

Immediately following the game and while Ss were still isolated, they were asked to evaluate the ST again. This, of course, comprised the post-experimental measure of attraction.

Phase III: Post-experimental debriefing. These procedures consisted of three steps. (1) A questionnaire was administered to obtain information about the Ss' perceptions of the experimental activities and especially of those constituting the experimental variables. (2) Ss were interviewed as a group to obtain further information about Ss' perceptions and to clarify responses to the questionnaire. (3) A full explanation was given of the actual experimental purposes and procedures.

Results

Procedures Perception Questionnaire

Analysis of the post-experimental questionnaire data warranted the following conclusions:

1. Ss reported accurately the number of trials on which they had received "winning" outcomes. Thus the conditions comprising the reinforcement variable had been accurately perceived.
2. There was some indication that reported winnings expectancy tended to increase with actual game outcomes. The bulk of the evidence, however, confirmed that the Ss were aware of the experimental expectancy conditions and judged the fairness of their outcomes on that basis.
3. Ss generally acknowledged, in response to direct questions, that maybe (as opposed to "probably" or "definitely") the experimental situation was not what it was represented to be, yet none verbalized any suspicions that:
   a. the ST was a confederate
   b. the ST talks were recorded

c. different ST column selections had been announced to each during the "game" (i.e., that the game outcomes had been controlled).

Attraction Measure

The post-experimental (Y) scores were adjusted for pre-experimental (X) levels, using treatment groups $b_{y.x}$ coefficients. The adjustment procedures (Y' = Y-bx) were adapted from discussions by Lindquist (1953) and Snedecor (1956).

Failure of the Y' scores to meet the normality assumption and the inequality of the independent variable intervals led to the decision to employ a non-parametric procedure for testing attraction measure trends (Ferguson, 1965).

The results are displayed in tabular form in Table 1 and in graphic form in Figure 2. As may be observed in Table 1, the quadratic trends are significant beyond the .05 level for both expectancy sub-groups. The significant linear trends are of only secondary interest, given the hypotheses being tested.

Using Tukey's procedures for internal contrasts (Glass and Stanley, 1970), the only significant comparison was the most extreme difference in the entire set of means, viz., the 10% reinforcement-25% expectancy sub-group versus the 50% reinforcement-25% expectancy sub-group. Of more critical interest, however, are three particular findings:

1. that the two conformity groups are not reliably different;
2. that the difference between the 25% and 50% reinforcement groups in the 25% expectancy condition is not beyond chance level;
3. that the apparent departures of some of the sub-group means from a regular quadratic progression are not reliable departures.

TABLE 1

ADJUSTED ATTRACTION MEANS AND VARIANCES WITH ASSOCIATED TREND SIGNIFICANCE TESTS FOR THE SEVEN REINFORCEMENT LEVELS AND TWO EXPECTANCY LEVELS

Expectancy Levels	Reinforcement Group							Z Values and Probability Levels					
	0%	10%	25%	50%	75%	90%	100%	Linear	p	Quadratic	p	Cubic	p
25%	$\overline{Y}'$= 210.47	196.87	218.40	227.87	216.73	211.00	219.80	1.90	<.03	1.78	<.04	<1	N. S.
	S^2= 615.80	716.07	656.60	421.00	229.21	343.00	434.43						
50%	$\overline{Y}'$= 194.20	207.87	202.67	218.46	216.29	211.97	206.75	1.56	<.06	2.10	<.01	<1	N. S.
	S^2=1149.86	395.50	793.64	80.26	795.57	280.54	393.00						

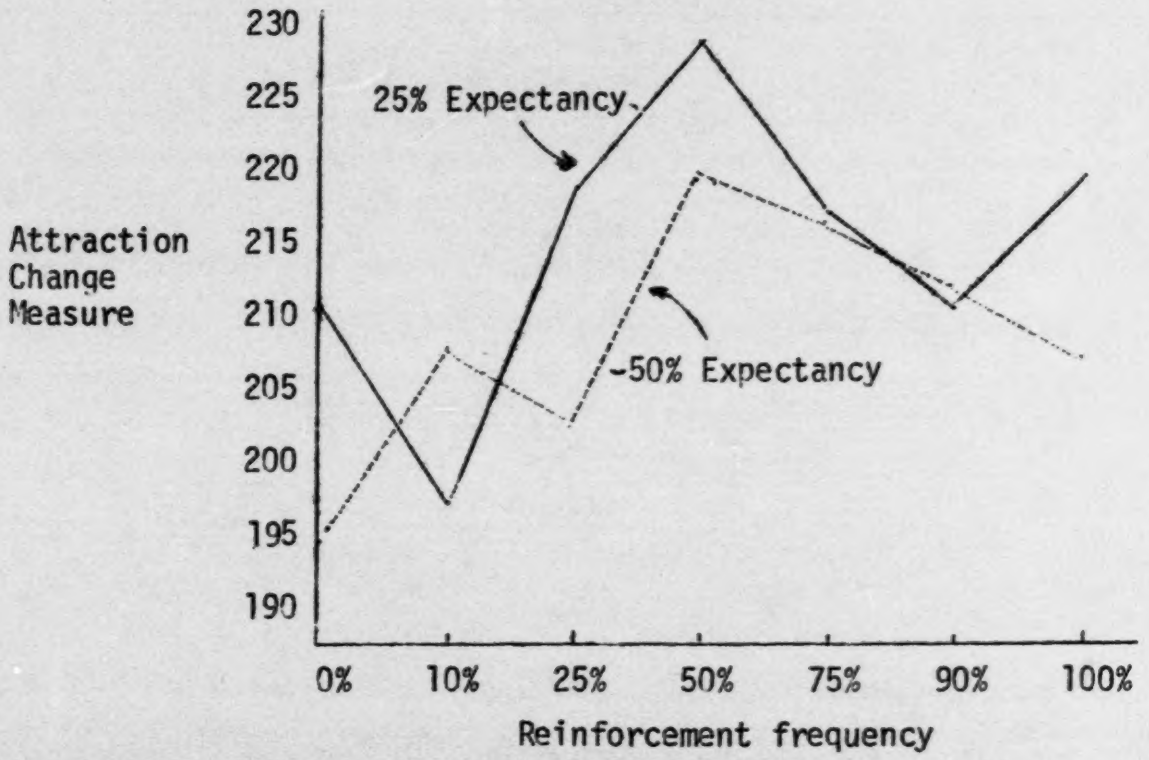

Figure 2. Curves showing Mean Attraction Change over Reinforcement Levels for the two Expectancy Levels.

Discussion

The findings are interpreted as rather clearly supporting the non-linear hypothesis relating interpersonal attraction to reinforcement whenever there are reinforcement expectancies. The present results accord quite well with the Bridgeman (1970) study in which the quadratic hypothesis was accepted, but not unambiguously. The use of seven reinforcement levels (compared with four in the 1970 study) and two levels of expectancy contribute substantially to the confidence that the quadratic trend findings are stable. Of more than passing interest also is the fact that this non-linear effect is stable over different student populations.

Accepting the experimental hypotheses in the above studies does not, however, mean that the obtained non-linearity is a product of the factors specified in the theoretical schema outlined in Figure 1. It

might be argued, for example, that the obtained functions could have been predicted from a "simple" cognitive consistency hypothesis and that the reinforcement conditions in these studies simply were not operative or that their effect was so miniscule as not to have been reflected in the attraction measure employed. There were several factors, however, which suggested that the game outcomes were effective as "reinforcements." Some of these conditions have already been described in reviewing the results of the post-experimental questionnaire. Apart from those findings, however, there was considerable casual evidence that the Ss were quite "involved" by the game procedures. Many of the Ss made copious notes on their game matrices as the game progressed, suggesting that they were attempting to discover principles to guide them in their game choices. Upon leaving the isolation cubicles after the game, considerable care had to be exercised to prevent Ss from communicating their game outcomes to one another. On the few occasions when such precautions were inadequate, Ss in every case tried to compare their outcomes. Although it might well be argued that the game outcomes as incentives may have served differing motive systems (e.g., need to "master" the game as opposed to a simple secondary motivation to win poker chips), it is not clear that their reinforcement role would necessarily be different.

In lieu of substantial contrary evidence, the assumption is maintained here that the reinforcement operations, while probably of low incentive value, were nevertheless functional. Obviously it will be of interest in future tests to vary systematically incentive and/or motivation levels as a means of gauging the role of these factors in determining the attraction response. The Figure 1 theoretical schema suggests the effect of increased incentive value should be to accentuate the

linear segment of the combined function and at extreme motive/incentive levels the reinforcement effect would mask altogether the expectancy-related effects.

If it can be assumed, then, that the reinforcement operations were valid, it is next of interest to compare the present findings with those of Byrne (e.g., 1965_a, 1965_b, 1967) in which he reports a positive linear relationship between reinforcement and attraction. Inasmuch as Byrne has not concerned himself with expectancy factors, the results of the present study are regarded as complementing his findings. Indeed, the significant linear trends found in the present results could be construed as providing additional support to the linear reinforcement-attraction hypothesis. And inasmuch as Byrne has developed empirical equations for the linear functions he has obtained, it might be possible, using his experimental procedures, to include expectancy conditions and thereby permit more precise inferences about the probable form of the expectancy function per se. And with this last point, it may be worth inquiring of the present data what inferences might be drawn about the shape of this hypothesized expectancy function.

Although the expectancy function schematized in Figure 1 might be said to approximate a "dissonance-like" function,[1] it should be acknowledged that there are two other expectancy-related hypotheses which might be relevant, viz., adaptation-level theory (e.g., Bevan, 1968) and McClelland's (1953) discrepancy hypothesis.

Considering the latter position first, it would appear that sub-

[1] It should be stated that this association of the theoretical expectancy function in Figure 1 with dissonance theory is a liberty taken by the writer. So far as the writer knows, none of the dissonance proponents have formulated that theory in explicit functional terms.

stituting McClelland's "butterfly" curve in Figure 1 would result in a composite curve which would be roughly cubic in form. There was some evidence of such a trend in the Bridgeman (1970) study, but its meaning was not at all clear. The present data show no evidence of any trend beyond the quadratic and, in sum, the results from these studies appear to give little support to McClelland's view of expectancy-discrepancy affect.

Similarly, there is little in the data to suggest that an adaptation level principle was operative. Adaptation theory predicts that reinforcement which exceeds the norm should have greater "value" (i.e., increased behavioral effects or affective intensity) than it would in the absence of such a norm or expectancy. Presumably, then, the more discrepant in a "positive" direction a reinforcement is, the greater the enhancement effect should be (up to some undefined limit). At least Bevan (1968, p. 706) reports one study in which such a linear effect appeared. From this, it would seem that the resulting reinforcement-attraction function should be positively accelerated over some substantial range of positive discrepancy. This clearly appears not to be the case in the results obtained in the present study.

In sum, then, insofar as expectancy factors may have contributed to the results of this study, the most plausible "model" of expectancy effects would be similar to that schematized in Figure 1.

Finally, the data are interpreted as supporting the first experimental hypothesis predicting a non-linear relationship between reinforcement and attraction. The second hypothesis, predicting a higher level of attraction change for the conformity (50%) group in the 50% expectancy treatment than for the conformity (25%) group in the 25% expectancy con-

dition is not supported.

This latter hypothesis was made on the dual grounds that (1) the post hoc analyses in the Bridgeman (1970) study suggested such a difference, and (2) that straightforward interpretation of the Figure 1 model would also predict such an effect. Because the Bridgeman (1970) results suggested that such a difference might be attributable to some sort of qualitative difference in expectancy (passive vs. active "aspirational"), data are currently being collected under such active, aspirational expectancy conditions. However, inasmuch as the data from the present study gave no indication of such a qualitative difference in expectancy, the question remains as to why the effect does not appear in accordance with the theoretical schema in which no such differentiation is made.

There is little evidence from the present study to guide conjecture about the matter. One possible guess is that the reinforcement factor is of such minimal value that its effects are not apparent over closely adjacent frequence levels. However, as noted earlier, the feasibility of such a speculation depends upon further testing.

References

Baron, R. M. Social reinforcement effects as a function of social reinforcement history. Psychol. Rev. 1966, 73:527-539.

Bevan, W. The contextual basis of behavior. Am. Psychol. 1968, 23:701-713.

Bridgeman, W. J. Student perception and productivity as a function of reinforcement and expectancy conditions. Paper presented at American Educational Research Association Meeting, 1970.

Byrne, D., and Clare, G. L. Effectance arousal and attraction. J. pers. soc. Psychol. Monograph. 1967, 6: (Whole No. 638).

Byrne, D., and Nelson, D. Attraction as a linear function of proportion of positive reinforcements. J. pers. soc. Psychol. 1965_a, 1: 659-663.

Byrne, D., and Rhamey, R. Magnitude of positive and negative reinforcements as a determinant of attraction. J. pers. soc. Psychol. 1965_b, 2:884-889.

Carlsmith, J. M., and Aronson, E. Some hedonic consequences of the confirmation and disconfirmation of expectancies. J. abnorm. soc. Psychol. 1963, 66:151-156.

de Charms, R., and Bridgeman, W. J. Leadership compliance and group behabior. Group Psychology Branch, Office of Naval Research. Tech. Rep. No. 9. Social Science Institute, Washington University, St. Louis, Mo., 1961.

Ferguson, G. A. Non Parametric Trend Analysis. Montreal: McGill University Press, 1965.

Glass, G. V., and Stanley, J. C. Statistical methods in education and psychology. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1970.

Harvey, O. J., and Clapp, W. F. Hope, expectancy and reactions to the unexpected. J. pers. soc. Psychol. 1965, 2:45-52.

Hollander, E. P. Conformity, status and idiosyncrasy credits. Psychol. Rev. 1958, 65:117-127.

Jackson, J. M. Structural characteristics of norms. In N. B. Henry (Ed.) NSSE Yearbook LIX, Part II. Chicago: University of Chicago Press, 1960.

Lamb, P. F., and Singer, J. E. Pleasant and unpleasant violations of expectations. Res. Bull. RB66-13 ETS, Princeton, N. J. 1966.

Lindquist, E. F. Design and analysis of experiments in psychology and education. Houghton Mifflin Co. Boston: 1956.

Lott, A. J., and Lott, B. E. Group cohesiveness as interpersonal attraction. Psychol. Bull. 1965, 64:259-309.

McClelland, D. C., Atkinson, J. W., Clark, R. A., and Lowell, E. L. The Achievement motive. New York: Appleton-Century-Crofts, 1953.

Sampson, E. E., and Sibley, L. B. A further examination of the confirmation or non-confirmation of expectancies and desires. J. pers. soc. Psychol. 1965, 2:133-137.

Snedecor, G. W. Statistical Methods. Ames, Iowa: Iowa State College Press. 1956.

Staats, A. W. Human learning. New York: Holt, Rinehart & Winston. 1964.

Verinis, J. S., Brandsma, J., and Cofer, C. Discrepancy from expectation in relation to affect and motivation. Tests of McClelland's hypothesis. J. pers. soc. Psychol. 1968, 9:47-58.